APPARATUS FOR DISPENSING FOOD PRODUCTS

Technical Field

This invention relates generally to the apparatus for dispensing food products and, more particularly, to an ice cream scoop rotatably mounted to a container of food product.

Background Art

In dispensing food products to be consumed by humans, it is desirable to have means for handling and serving the product in a manner that reduces possible contamination by germs and bacteria. Where food products are sold to the public at a fixed cost per serving, it is also desirable to dispense consistently sized serving portions. In order to retain the volume and texture of frozen products such as ice cream, sherbet, and yogurt, the product is ideally dispensed in a manner that does not compress the particles of air suspended in the frozen product.

There are several devices currently available for dispensing semi-frozen or soft-serve food products such as ice cream, frozen yogurt, whipped topping, cheesecake filling, and pudding. In many of these devices, the product is poured into the machine in its liquid state and chilled to a temperature that allows the product to be dispensed through a nozzle in a soft-serve state. There are several drawbacks with these devices including their inability to dispense food products that are frozen to a firmer state and the inability to automatically dispense consistently sized serving portions. Additionally, food product is often wasted when using these devices because unused product must be emptied periodically in order to clean the machine with a sanitizing solution. The product emptied from the machine is also generally not reusable.

Ice cream and other frozen food products that are frozen to a firm or hard state are often dispensed by hand using an implement such as a curved spatula or scoop. This manual process is

slow, difficult, labor-intensive, and exposes the product to risk of contamination. It is also difficult to control the quantity of product dispensed per serving. U.S. Patent No. 5,385,464 issued to Anderson teaches an apparatus for automatically dispensing hard ice cream that includes a conveyor mechanism for dispensing a predetermined quantity of food product. One drawback to the Anderson device, however, is that the conveyor mechanism compresses the frozen ice cream during delivery, thereby reducing the volume and changing the texture of the dispensed product. Another drawback is that the Anderson device is only designed for use with three gallon tubs and is not adaptable to various sizes and types of containers. It is further desirable to have a device which may be fitted to a container during manufacture or after the food product is placed in the container, and is disposable after use to reduce the possibility of food contamination.

Accordingly, the present invention is directed to fulfilling these needs and overcoming one or more of the problems as set forth above.

Disclosure Of The Invention

The present invention for dispensing food products such as ice cream, yogurt, sherbet, sorbet, whipped topping, cheesecake filling, pudding and the like, comprises a scoop having a channel portion with a tapered, semi-circular cross section along a curved axis. The scoop is designed to be mounted on and adjacent to a container of food product and to extend substantially across one half of the opening of the container. The scoop may be mounted to the container with the smaller cross-sectional area mounted adjacent to the sidewall of the container and the larger cross-sectional area mounted proximate the center of the container. The cross-sectional area of the channel is also preferably tapered. The channel has a leading edge and

a trailing edge. The scoop is rotated around the container with the trailing edge engaging the exposed layer of the food product. As the exposed layer of food product is scraped up by the trailing edge, it is guided within the semi-circular channel and moved toward an opening in the portion of the scoop having the larger cross-sectional area. The product is dispensed using product forming means to gather the product as it moves through the opening in the scoop and forms it into the desired shape and size for the serving.

The scoop is attached to the mounting means so that the trailing edge engages the exposed layer of product. The mounting means for the scoop is attached to one end, the open end, of the container. The container may be fitted with a movable portion at the opposite end of the container so that as force is exerted on the movable portion it pushes the product toward the scoop as it rotates and continues to remove the exposed layer of product. With this configuration, the edges of the scoop remain engaged with product as the exposed layer is dispensed.

The scoop may be rotated by various means including manually, or with a drive mechanism such as a belt or a gear and sprocket assembly. Alternatively, the container may rotate while the scoop remains essentially stationary. Serving portions are controlled by the size of the channel in the scoop, the depth of the trailing edge engaged with the product, the number of rotations of the scoop around the container, and the forming and dispensing means.

Brief Description Of The Drawings

Fig. 1 is a perspective view of the scoop member of the present invention showing a curved channel portion;.

Fig. 1.1 is a cross-sectional view of the scoop member showing the relative heights of the leading and trailing edges of the semi-circular channel portion;

Fig. 2 is a perspective view of the scoop member of the present invention showing an opening in the scoop member;

Fig. 3 is a perspective view of one embodiment of a forming and dispensing apparatus for use with the scoop member;

Fig 4 is a perspective view showing the forming apparatus in the dispensing position;

Fig. 5 is an exploded perspective view of the various components associated with the scoop member of the present invention mounted adjacent to a container of frozen product;

Fig. 6 is a perspective view of the scoop member in an alternate position with respect to a container;

Fig. 7 is a top view of an example of means for rotatably mounting the scoop member adjacent the container; and

Fig. 8 is a top view of another example of means for rotatably mounting the scoop member adjacent the container.

Best Mode For Carrying Out The Invention

Referring to the drawings, Fig. 1 shows a scoop 20 having a curved channel 22 with a semi-circular cross-section. The channel 22 has a leading edge 24 and a trailing edge 26 as best shown in Fig. 1.1 wherein the trailing edge 26 extends outwardly further than the leading edge 24. When the scoop 20 is mounted on a container of food product such as ice cream, yogurt, sherbet, and sorbet, the trailing edge 26 engages the product and scrapes off the exposed layer of the product as the scoop 20 is moved across the container and feeds the scraped off product into

and along the channel 22. The semi-circular channel 22 guides the product so that it rolls around itself in the channel 22 as the exposed layer of the product is scraped off. The leading edge 24 of the channel 22 may be curved inwardly to promote rolling of the product and to help retain the layer of product scraped off by the trailing edge 26 within the channel 22.

As shown in Fig. 1, the semi-circular channel 22 is tapered having its larger diameter near first end portion 28 and its smaller diameter near second end portion 30 of the scoop 20. The taper associated with the channel 22 serves to further guide the product in the channel 22 toward the first or larger end portion 28 of the scoop as the product fills the small end of the taper and expands toward the larger end portion 28. The scoop 20 and the channel 22 are shown in Fig. 1 as being curved along their lengths. The curvature may be varied in different embodiments of the scoop 20, and may even be substantially straight, along the length of one or both sides of the scoop 20 and/or the channel 22.

Fig. 2 shows a side of the scoop 20 that is opposite the side with the open channel 22 in Fig. 1. As the product is guided through the channel, it emerges through an opening 32 at the end portion 28 of the scoop 20. To dispense the product as it emerges from the scoop 20, means for forming the product into the desired shape and size for serving may be positioned adjacent the opening 32 in the scoop 20. Figs. 3 and 4 show an example of a forming and dispensing assembly 33 including a semi-spherical cup 34 sized to fit in the opening 32 in the scoop 35. In the example shown in Figs. 3 and 4, rotatable bar members 36, 38 are fastened respectively to opposite sides of the cup 34. The means for fastening the bar members 36, 38 on either side of the cup 34 can include a screw or a rivet 40 passing through the side of the cup 34 and the scoop

35 to engage one end of the bar members 36, 38. A handle 42, 44 or motor is or may be attached to the other end of each of the bar members 36, 38 to aid rotation of the bar members 36, 38.

Fig. 3 shows the concave side of the cup 34 positioned over the opening 32 of the scoop 35 to receive the product as it emerges from the opening 32. Once the cup 34 is filled, the operator can rotate either bar member 36 or 38 thereby rotating an edge of the cup 34 through the product to obtain the desired serving portion. When the cup 34 is rotated so that the convex side of the cup 34 is facing outwardly, the operator may remove the product from the cup 34 and place it into the desired receptacle such as an ice cream cone. The forming and dispensing assembly 33 may include means (not shown) for releasing the product from the cup 34 as found in various ice cream cups and other food dispensing apparatus in the prior art.

The present invention may be used with various types of forming and dispensing means. The forming and dispensing means shown in Figs. 3 and 4 are shown solely to illustrate one means for forming and dispensing a desired quantity of product. Other forming and dispensing means may be used in conjunction with the present scoop 35. For example, cups having a various shaped may be positioned to receive the product as it emerges from the opening 32 in the scoop 35. Means such as a knife or spatula (not shown) may also be used to cut through the product between the cup 34 and the opening 32 of the scoop 35. If the cup has a shape that prevents it from being rotated within the opening of the scoop 35, then it may be pivotally attached adjacent to the opening in the scoop 35 to allow access to the product in the cup.

There are a number of ways to facilitate rotating or moving the scoop 35 through the product which may be used alone or in combination with one another. One alternative is to embed one or more heating elements (not shown) in the scoop and/or in the forming and

dispensing means, to heat them during the scooping, forming, and dispensing process. Another alternative is to use non-stick coatings on the various components of the apparatus. Yet another alternative is to embed or attach one or more heat conductive strips or particles at desired locations on the scoop such as along the leading edge, or within the semi-circular channel. The operation of any heating device can be controlled depending on the movement of the scoop to prevent unnecessary melting of the product.

Fig. 5 shows an assembly of the present scoop 50 mounted to a platform 52 that is built into or otherwise fixedly attached to a lid structure 56 that fits over an open end of a container 54 of frozen product such as ice cream. Alternatively, the scoop 50 may be formed as an integral part of the lid 56. Any size or shape of container 54 may be used with the present invention, however, a round container 54 with a radius similar to the length to the scoop 50 results in most of the product being accessible for dispensing as the scoop 50 is rotated around the container 54.

As shown in Fig. 5, the scoop 50 is mounted in the platform 52 or formed in the lid 56 so that the edge 58 of the scoop 50 engages the exposed layer of the product when the lid 56 is positioned over or against the container 54. The lid 56 may be sealed, clamped, or otherwise fixedly attached to the container 54 using any suitable means. It is important for the scoop 50 to be attached to the lid 56 in a manner that allows the scoop 50 or the scoop 50 and the lid 56 combination to rotate around the open end of the container 54.

As the scoop 50 is rotated, the exposed layer of the product is removed. In order for the trailing edge 58 of the scoop 50 to remain engaged with the product, the product is pushed toward the scoop 50. Fig. 5 shows the container 54 having an example of means for moving the product in the container 54 toward the scoop 50. The end 59 of the container 54 opposite the

scoop assembly 50 has a cover 60 with a central access port 61 to allow force to be applied to a plunger 62 that has rod 63 and from there to the plunger 62. A seal 64 may be included around the edge of the plunger 62 that scrapes the product from the sidewall of the container 54 as the plunger 62 moves, to reduce waste of the product. The plunger and related parts may be disposed of along with the container 54 after the food product is removed from the container 54. Alternatively, the plunger 62 and the adjacent end cover 60 may be removable for use with another container 54 or to allow the container 54 to be refilled with food product.

In alternative embodiments, the scoop 50 may remain stationary and the container 54 may be rotated. Additionally, the means for keeping the trailing edge 58 of the scoop 50 engaged with the product could include means for pushing the scoop 50 toward the product during rotation.

Fig. 6 shows an alternative position of a scoop member 72 which is located adjacent to a container 70 that rotates. The scoop 72 is mounted so that the opening 74 is adjacent to the outer edge rather than the center of the container 70. The product moves toward the opening 74 as the container 70 rotates and the exposed layer of product is removed by the scoop 72. Forming and dispensing means such as that discussed hereinabove, may then be positioned near the edge of the container 70.

The orientation of the scoop, the container, and the forming and dispensing means may vary depending on the needs of the user. For instance, the scoop may be oriented with the side containing the channel facing upwardly, downwardly, to the side, or at any angle in between. The orientation of the container and the forming and dispensing means depend on the orientation of the scoop. The trailing and/or leading edge of the scoop may also be tapered from one side to

the other to engage and remove more product. Further, the scoop may be oriented at an angle with respect to the exposed layer of product in the container depending on the particular application of the present invention.

The amount of product dispensed is controlled by the number of rotations of the scoop or container relative to each other, the depth of the cutting or scraping edge of the scoop, the cross-sectional area of the channel, the forming and dispensing means, and the texture or consistency of the product. The present scoop may be used with a variety of frozen or semi-frozen products including those containing solid particles such as crushed cookies, and is especially useful for products that are frozen at temperatures between plus and minus 10° F. At these temperatures, products such as ice cream, yogurt and sherbet are in a "hard freeze" state and are difficult to scoop by hand. Further, products at these temperatures contain suspended air particles that form during the freezing process and are important to the texture and appearance of the product. The present scoop is designed to dispense consistently sized serving portions so that the desired number of servings expected from large containers is known in advance and are delivered. The present scoop is adaptable to various types of containers that are used to distribute commercial quantities of food product.

The present scoop may be manufactured from several types of materials including various plastic and metallic compounds. One important aspect of the present scoop is that it may be used to improve sanitation in retail and commercial applications by reducing contact between the operator and the products. This is accomplished by installing the scoop and/or any related assemblies with the container before it is distributed, and disposing of the scoop along with the container once the product is emptied from the container. Since the scoop does not have to be

re-used, problems associate with improper cleansing and transferring contaminated implements from one container to another are avoided. Further, use of the present scoop reduces manual handling of the product, thereby reducing the risk of product contamination by humans.

Figs 7 and 8 show alternate means for rotating the scoop or the container. Fig 7 shows a conventional, motorized gear and sprocket mechanism 90 wherein the gearing 92 may be attached to the edge of a lid containing the scoop member 94. Alternatively, the gearing may be attached to the container, depending on whether the scoop or the container is to be rotated. Fig. 8 shows a conventional motorized belt drive mechanism 100 that may be used to rotate the scoop or the container. Further, the scoop or the container may be rotated manually using an external handle.

Other aspects, objects and advantages of the present invention can be obtained from a study of the drawings, the disclosure and the appended claims.